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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/651,431 08/30/00 STREUBEL

W BO-107

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IM22/0817

EXAMINER

WILKINS III, H

ART UNIT

PAPER NUMBER

1742

DATE MAILED:

08/17/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary

Application No.

09/651,431

Applicant(s)

STREUBEL ET AL.

Examiner

Harry D Wilkins, III

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 25 June 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-13 are pending.
2. The rejection under 35 USC 112, 2nd paragraph has been withdrawn in view of the remarks filed 25 June 2001.
3. The rejection under 35 USC 103 based on the Toepker et al, Wassilew et al, Connelly and Keen references has been withdrawn.
4. The rejection under 35 USC 103 based on the Toepker et al, Wassilew et al, Wardwell et al and Keen references has been withdrawn.
5. The new grounds of rejection are as follows.

Drawings

6. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 25 June 2001 have been approved.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toepker et al (EP 0 752332 A1) in view of Metals Handbook Volume 1 and ASM Handbook Volume 5.

Toepker et al teach (see English abstract and figs. 1-5) a transverse support for a twist beam rear axle with a centrally located U-shaped cross section formed from a

tube. The support would have been expected by one of ordinary skill in the art to be bending-resistant and torsionally yielding.

Toepker et al do not expressly disclose any processing method by which the support is made. However, it would have been within the expected skill of a routineer in the art to have used conventional cold forming techniques, such as press forming, in order to manufacture a tubular profiled member with a torsionally yielding central longitudinal section of a U-shaped cross-section and with opposed torsion-proof end sections as seen in figures 1-5 of Toepker et al. One of ordinary skill in the art would have expected the method to include a further step of configuration processing for completing a twist beam rear axle. The method does not include the steps of annealing, hardening, tempering and outer surface hardening.

The Metals Handbook Volume 1 teaches (see page 241) that hot-rolled medium-carbon steels (i.e.-tempering steel) are generally subjected to a standard heat treatment. The heat treatment involves annealing at a suitable temperature, hardening by quenching in a suitable medium, such as water, and finally tempering at a temperature below the critical range to produce a desired hardness.

Though no specific temperature and time for the annealing, hardening and tempering steps are disclosed, it would have been within the expected skill of a routineer in the art to have selected and optimized the known result effective variables of annealing time and temperature, quenching start temperature, and tempering time and temperature.

The ASM Handbook Volume 5 teaches (see pages 708-709) that shot peening can be applied to the surface of carbon steels in order to reduce fatigue failures in parts subjected to cyclic loading, such as an axle.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the conventional annealing, hardening and tempering heat treatment, as taught by the Metals Handbook Volume 1, and the conventional shot peening surface treatment, as taught by the ASM Handbook Volume 5, to the twist beam rear axle of Toepker et al because the Metals Handbook Volume 1 teaches that the heat treatment is applied to produce desired hardness and microstructure in a final product and the ASM Handbook Volume 5 teaches that shot peening reduces fatigue failures in parts subjected to cyclic loading.

Regarding claims 2-4, it would have been within the expected skill of a routineer in the art to have optimized the known result effective variable of annealing temperature in the process taught by the Metals Handbook.

Regarding claim 5, the Metals Handbook teaches (see page 151) that a standard carbon steel is SAE-AISI 1524 (and 15B24) (which is equivalent to 22MnB5). Therefore, it would have been obvious to one of ordinary skill in the art to have selected the known steel for use in a twist beam rear axle.

Regarding claims 6 and 7, the ASM Handbook Volume 5 teaches that shot peening can be applied to carbon steels. Therefore, it would have been obvious to one of ordinary skill in the art to carry out the surface hardening by the conventional method of bombardment with steel balls (i.e.-shot peening).

Regarding claim 8, it would have been within the expected skill of a routineer in the art to apply the annealing step as taught by the Metals Handbook to only the sections of the support where the desired hardness and microstructure were required (i.e.- the transitional sections between the central longitudinal section and the end sections).

9. Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toepker et al (EP 0 752332 A1) in view of the ASM Handbook Volumes 4 and 5.

Toepker et al teach (see English abstract and figs. 1-5) a transverse support for a twist beam rear axle with a centrally located U-shaped cross section formed from a tube. The support would have been expected by one of ordinary skill in the art to be bending-resistant and torsionally yielding.

Toepker et al do not expressly disclose any processing method by which the support is made. However, it would have been within the expected skill of a routineer in the art to have used conventional cold forming techniques, such as press forming, in order to manufacture a tubular profiled member with a torsionally yielding central longitudinal section of a U-shaped cross-section and with opposed torsion-proof end sections as seen in figures 1-5 of Toepker et al. One of ordinary skill in the art would have expected the method to include a further step of configuration processing for completing a twist beam rear axle. The method does not include the steps of case-hardening and outer surface hardening.

The ASM Handbook Volume 5 teaches (see pages 948-949) that case-hardening is a conventional process and that carburizing and quenching are performed to enable surface hardening.

The ASM Handbook Volume 4 teaches (see page 371) that when shot peening is applied to case hardened steel in order to increase surface compressive residual stresses. This process has the effect of improving bending fatigue performance.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied case-hardening and shot peening, as taught by the ASM Handbook Volumes 4 and 5 because the case-hardening increases the hardness of the surface of the steel and the shot peening improves bending fatigue performance.

Regarding claim 10, it would have been obvious to one of ordinary skill in the art to have selected the conventional C15 (ASTM A 576) steel because it has specific mechanical property requirements which are desirable for a twist beam rear axle.

Regarding claim 11, it would have been within the expected skill of a routineer in the art to apply the case-hardening step as taught by the ASM Handbook to only the sections of the support where the desired surface hardening was required (i.e.- the transitional sections between the central longitudinal section and the end sections).

Regarding claims 12-13, the ASM Handbook Volume 4 teaches applying the surface hardening as shot peening. Therefore, it would have been obvious to one of ordinary skill in the art to carry out the surface hardening by the conventional method of bombardment with steel balls (i.e.-shot peening).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 703-305-9927. The examiner can normally be reached on M-F 8:15am-4:45pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3599 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Harry D Wilkins, III
Examiner
Art Unit 1742

hdw
August 16, 2001

ROY KING 
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700